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ABSTRACT

This study analyzed how faculty and graduate students interacted within a distance education environment when a new technology was introduced. Data from an education course offered via interactive audio/video and supported with Web-based materials and interaction opportunities were analyzed. Initially, the course was developed for delivery through an interactive audio/video classroom. After the initial class, the instructor recognized an inability to meet student needs and sought advice from a technical advisor. This led to a decision to include Web-based support. The advisor developed the skeleton of the course. Participant observations and email correspondences were collected by the instructor to help improve the quality of instruction. These data provided information regarding students' content area knowledge and how students and faculty reacted to new technologies. Persistent observation by the technical advisor provided supplemental information to improve instructor and student techniques for utilizing technology. With the help of the technical advisor, the instructors's delivery methods improved quickly. Interactions within the Web-based course were initiated by both the instructor and the technical advisor. Personal dispositions of the instructor, students, and technical advisor were critical to the success of the course. (Contains 16 references.) (SM)

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Running head: CREATING LEARNING ENVIRONMENTS USING TECHNOLOGY

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Abstract

This case study analyzed how faculty and graduate students interact within a classroom environment when a new technology is introduced. Data from a graduate education course offered via interactive audio/video, supported with web based materials and interaction opportunities were analyzed. Initially the course was developed for delivery through an interactive audio/video classroom; after the initial class meeting the instructor recognized the need to supplant the weaknesses in the audio/video technology with web-based support. Participant observations and email correspondence were collected by the instructor for the purpose of obtaining data for improving the quality of instruction. This data provided information regarding content area knowledge in the course; it also provided valuable information concerning how students and faculty reacted to new technologies. Persistent observation by a technical advisor, provided supplemental information and depth to improve instructor and student techniques for utilizing technology.

Opening Gates of Learning Environments through Technology:

Introducing New Technologies to the Adult Learner

"The internet is perhaps the most transformative technology in history, reshaping business, media, entertainment, and society in astonishing ways. But for all its power, it is just now being tapped to transform education." (Web-Based Education Commission, 2000, pg 17)

Distance-learning has existed in the field of higher education for over 100 years. While earlier versions of distance-learning were largely based upon correspondence-style course work, later versions began to adapt new technologies to meet the needs of distance learners. Although these new technologies have offered institutions of higher education greater flexibility in meeting the needs of distance learners, they were not adopted with great ease by either the post-secondary faculty or their students. However negatively it was initially received, interest and demand for distance-learning grew. Today, student demand for distance-learning courses is enormous, and post-secondary institutions and faculty are searching for methods to adequately meet this growing demand.

This study was designed to develop an understanding of the interactions and intra-actions of faculty, students, and course materials and to facilitate understanding and make professional judgments for future application using technology as a medium of instruction.

Review of Literature

As technology evolves, faculties need to adjust to new approaches to teaching to enhance opportunities for student learning. Adjustment and change does not come readily, though, and faculty have many issues that serve as deterrents toward the adoption of new technologies in the classroom. These deterrents include a variety of issues including compensation for the additional preparation time, adjustment in workload, course ownership and opportunities for training (Bower, 2001; Care & Scanlon, 2001; Dusick, & Yildirim, 2000; Johnson & DeSpain, 2001; Millis, 1994). Further compounding the issue of deterrents, Saye (1998) found that educators would only adopt technology within their classrooms when they perceived that it would be "good teaching" to do so. Beaudoin (1998) eloquently wrote that technology is changing how students will learn and therefore is changing how instructors should teach. He said that "technology is just a medium; it is the professorate who must define its application for the purpose of achieving worthwhile educational ends" (Beaudoin, 1998).

When considering distance-learning training needs of faculty, one must first understand what contributes to the quality of a distance-learning course that enhances the potential for student learning. Garrels (1997) identified five critical elements for successful distance-learning teaching. These five critical elements included instructor enthusiasm, organization, strong commitment to student interaction, familiarity with the technology used in the class format, and critical support personnel. In fact, a faculty member's ability to promote the three types of interaction (instructor-student, student-student, and student-instructional materials) is paramount to success (Connell, 1996; Hassenplug & Harnish, 1998). When considering faculty training in preparation of new

distance-learning course offerings, research indicates that distance-learning courses may demand that faculties adopt new pedagogies. Successful pedagogies may be similar to traditional "face-to-face" course delivery, but with a less hierarchical teaching-learning process and a greater emphasis on cooperative student-to-student interaction (Diekelmann, Schuster, Nosek, & Hamilton, 2001).

Hassenplug & Harnish (1998) identified several techniques for improving student interaction. Techniques are divided into categories based upon the method of delivery. Within audio/video synchronous courses, instructors can encourage interaction by asking questions of students at remote sites. Hassenplug & Harnish (1998) indicate that instructors may further promote interaction by traveling to and conducting the course from remote sites. Interesting to note is that these same researchers found that the perception of interaction might be more closely correlated to satisfaction with the course than the actual quantity of interaction within the course (Hassenplug & Harnish, 1998).

Although faculty members may be quite comfortable with increasing interaction in a traditional face-to-face course, they may find that they lack the technical expertise to structure this kind of interaction in a distance-learning environment. The literature indicates that administrators understand that success of a distance-learning course relies heavily upon an individual faculty member's ability to use the technology and encourage interaction. (Johnson & DeSpain, 2001; Husmann & Miller, 2001) However, Deans of the Colleges of Education were under the misperception that their faculties already were competent enough to handle the new technologies. (Johnson & DeSpain, 2001).

Problem Statement

A review of the literature suggests that for instructors and students a lack of technology skills, a lack of willingness to participate, low technology self-perception and comfort level, and certain personality types may prevent extensive use of technology for classroom interaction. The adult learner brings an established personal philosophy to the graduate classroom. Philosophy contributes to professionalism. "Having a philosophic orientation separates the professional continuing educator from the paraprofessional in that the professionals are aware of what they are doing and why they are doing it." (Mirriam, 1982, 90-91) Students taking graduate courses are professionals. As adult learners they possess a dominant modality that developed early in life. This preference may not change easily. Learners my be "aided or handicapped by educators teaching-learning preferences" (Flannery , 1993, 7) and mastery can only be demonstrated through the preferred method, while Keefe (1988) believes the instructor's commitment to a multi-sensory approach will eventually lead the student to a different individualized approach. Hiemstra (1991) used a very broad view that included environmental, cultural, social, and psychological as well as physical paradigm shift to include perspective transformation.

Research Question

How does the introduction of new technologies affect the interactions and intra-actions of faculty, students, and course materials?

Method

Participants

Participants for this case study were students and the course instructor for a graduate special education class. The potential for student enrollment in the course was restricted to students participating in a masters degree teacher education program with specialization options in pedagogy or instructional technology, or those pursuing professional development in the field of education.

Setting

The classroom included four sites. The 25-year veteran instructor for the course had limited experience teaching in a distance-learning audio/video environment, and was new to this particular audio/video system. Additionally, the instructor had no experience with web-based curriculum or courseware. The technical advisor, a three-year college instructor, had extensive technology experience. She served as a guest instructor for business coursework taught via audio/video and had experience instructing online coursework. Additionally, the technical advisor had extensive experience assisting faculty in modifying curriculum for both delivery methods.

Initially the course was developed for delivery through an interactive audio/video classroom. The framework for delivery of audio/video coursework at this institution required the instructor to have proficiency in operating all technical equipment and to operate the equipment while teaching. While this increased the responsibility of the instructor, it also provided the opportunity for the instructor to move between delivery sites. Within the context of this institutional framework, the instructor's intent was to

broadcast from the initiating site to three additional locations. Additionally, plans existed for the instructor to alter the initiating site, during the course, and originate instruction at least once from each location.

Procedure

After the initial class meeting the instructor, recognizing the need to supplant the weaknesses in the audio/video technology consulted with the technical advisor; that consultation resulted in supplanting the audio/video technology course with web-based support. Expediency in adopting the web-based support limited the choice to the free courseware offered by Blackboard. This courseware also offered the students free access and an opportunity for both instructor and students to explore the environment without purchasing proprietary software. To support the instructor in fledgling efforts to use web-based instruction, the technical advisor served as an assistant instructor guiding students and the primary instructor in the web-based platform. Students were invited to interact with the technical advisor whenever they had questions about the web-based system. In an effort to foresee possible technology issues, the technical advisor had access to the web-based site and could post information to individuals or the class using an assistant instructor mode.

The primary data gathering method for this explanatory case study was teacher observation and persistent observation by the technical advisor to provide an alternative viewpoint and anecdotal student correspondence.

Findings

Within this research, observations were made based upon two perspectives. The initial perspective was from the instructor of the course. As a veteran teacher, the instructor was able to readily identify concerns with student learning and instructor technical expertise. The second perspective was one from the technical advisor. The opinion of the technical advisor was only consulted after the instructor for the course recognized difficulty within each technology delivery method. Findings within this research were based upon these two perspectives.

Initially the instructor was very enthusiastic about delivery of the distance-learning course via two-way audio/video synchronous interaction. This is consistent with the research indicating that new distance-learning educators perceive that synchronous audio/video delivery is the preferred distance-learning delivery mode as it most closely resembles the traditional face-to-face classroom. As such, educators perceive that interactions within the classroom will mimic the traditional classroom. Educators soon discover that their perception is faulty and the audio/video synchronous delivery usually does not allow faculty to see students clearly enough to identify subtle visual cues that are evident in face-to-face classrooms. Additionally, this synchronous delivery mode may in fact reduce an instructor's ability to rely upon traditional face-to-face methodology due to an inherent delay in audio or video response time. The instructor's ability to facilitate learning based upon student-to-student interaction in the classroom may also be impeded by the student's inability to operate the equipment.

Initial perception of the instructor of the graduate special education course confirmed the perceptions and interactions evidenced by prior research. The instructor reported

extreme difficulties with the synchronous delivery mode after the first class. The instructor recognized an inability to read subtle cues, failure to plan for a back up in case of technical difficulties, a lack of expertise in manipulation of technical tools, inefficiencies of operating equipment while teaching and an overwhelming sense of an inability to facilitate learning by promoting student-to-student interaction. The instructor, recognizing an inability to meet student needs, sought advice and assistance from the technical advisor.

Consultation with the technical advisor led to a decision to supplant the synchronous course with web-based curriculum. This recommendation by the technical advisor was based upon research that suggests that web-based materials can help to support student-to-student and student-to-instructor interaction and improve the quality of access to text-based materials.

As the instructor of the graduate special education course was only minimally familiar with web-based instruction, the technical advisor developed the skeleton of the course. The skeleton consisted of the syllabi, tentative schedule, and notes from the first course session. Shortly thereafter, student concerns regarding access to the library, how to post discussion items, and how to attach documents to discussion items or email postings surfaced. These student concerns promoted the development of brief, graphically enhanced online notes to help the students through the process of accomplishing these tasks.

While initial observations in the synchronous classroom by the technical advisor raised concerns, as the course progressed, the delivery methods of the instructor improved at a very fast pace. Observations by the technical advisor toward the end of the

semester yielded a perception that the instructor had a wonderful synchronous distance-learning persona and had developed significant skills in the delivery of synchronous distance-learning coursework.

Interactions within the web-based course were both initiated by the instructor and the technical advisor. Since the skeleton of the course was developed by the technical advisor, all technical questions at the beginning of the course were addressed to that individual. Initially there were a high number of student to technical advisor interactions due to the instructor's unfamiliarity with the delivery system; this became less frequent after only a few weeks. As the course progressed, the instructor was able to add materials as needed and answer many of the technical questions.

Building upon Garrels (1997) discussion of instructor enthusiasm, the researchers believe that personal disposition may be one of the most critical factors. However, we would expand upon Garrels definition to include not only the enthusiasm of the instructor, but the interplay between the personal dispositions of the instructor, students, and support personnel as critical to the success of distance-learning coursework. This is consistent with distance-learning research that discusses the importance of instructor-to-student interaction (Connell, 1996; Hassenplug & Harnish, 1998).

Recommendations for Future Study

Our study illustrated a paramount need for direction and instruction for the teaching personnel who must undertake a distance-learning class. As such, it leads us to make the following four recommendations: the development of a digital resource help desk, technical advisor mentoring, development of distance-learning pedagogy coursework, and further research regarding the personal disposition triad.

Our first recommendation would include the adoption of a digital resource help desk by institutions offering distance-learning coursework. These digital help desks should consist of royalty free materials explaining necessary course support systems, e.g., accessing library materials, attaching documents to email, and formatting to save documents and academic support systems.

Second, while the researchers would prefer that instructors have a high degree of technical training prior to beginning a distance-learning course, one can not quarantee that the training will be meaningful to an individual until he/she is experiencing teaching a course via distance-learning. Research indicated that instructors will not adapt to new technologies until they perceive that it will improve the potential for student learning. Perhaps initial technology trainings are not immediate enough, or do not provide the personal meaning significantly enough, to be effective; therefore, an instructors may need to be paired with a technical advisor to serve as a mentor during initial distance-learning course offerings.

Third, since educational institutions are moving toward increasing the number of distance-learning course offerings, it is more important than ever for institutions to begin developing distance-learning pedagogy coursework. For years we have developed the methodology for traditional face-to-face delivery, and nurtured the instructor and students who best learn and teach in these environments; perhaps now is the time to consider that there may be instructors and students who would best learn in digital or distance-learning environments. These instructors and students must be served.

Finally, distance-learning research in the area of interaction coupled with Garrel's (1997) findings for determining success of distance-learning coursework suggests further

study in the area of the distance-learning interaction triad. Anecdotal information in this area suggests that this may be one of the most exciting areas for further research in distance-learning course delivery.

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